



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/714,382	11/14/2003	Hans Christian Alt	032301.355	3954
25461	7590	11/05/2004		
SMITH, GAMBRELL & RUSSELL, LLP SUITE 3100, PROMENADE II 1230 PEACHTREE STREET, N.E. ATLANTA, GA 30309-3592				EXAMINER HERTZOG, ARDITH E
				ART UNIT 1754
				PAPER NUMBER

DATE MAILED: 11/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/714,382	ALT ET AL. <i>PA</i>
	Examiner	Art Unit
	Ardith E. Hertzog	1754

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 06 August 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-8, 10 and 11 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-8, 10 and 11 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) 1-8, 10 and 11 are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 14 November 2003 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                        |                                                                             |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                        | Paper No(s)/Mail Date. _____                                                |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|                                                                                                                        | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Response to Amendment - Election/Restriction***

1. This action is in response to applicant's amendment filed August 6, 2004. Claims 1-8, 10 and 11, per said amendment, are now pending.
2. Applicant's election of the invention of Group I, as set forth in the prior Office action with mailing date May 5, 2004 (hereinafter "the 5/5/04 action"), paragraphs 1.-5., corresponding to present process claims 1-8, 10 and 11, in said amendment is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election **without** traverse (see MPEP § 818.03(a)). **Moreover**, as stated by applicant in said amendment, "[apparatus c]claim 9 [, directed towards the invention of Group II,] has been cancelled without prejudice to the filing of any divisional or continuing applications" (see remarks accompanying said amendment at p. 6, second paragraph).
3. Acknowledgement is made of the new title submitted by applicant, in response to paragraph 8. of the 5/5/04 action.
4. The objection to the disclosure as set forth in the 5/5/04 action, paragraph 9., has been **overcome** by applicant's amendment. **However**, note the **new** objection to the disclosure made in response to said amendment set forth in paragraph 7. below.
5. The objection to claims 3 and 4 as set forth in the 5/5/04 action, paragraph 10., has been overcome by applicant's amendment.
6. The 35 U.S.C. § 112, second paragraph, rejection of claim 2 as set forth in the

5/5/04 action, paragraph 12., has been **overcome** by applicant's amendment.

However, the new 35 U.S.C. § 112, second paragraph, rejections made in response to said amendment set forth in paragraphs 9. and 10. below.

***Minor Informalities***

7. The disclosure is objected to, because of the following minor informalities:
  - a. In **both** claims 1 **and** 10, the last line, "composition" should be replaced with "preparation", for consistency with the "liquid substance preparation" as now recited earlier in both claims.
  - b. **Analogously**, in claim 8, at line 2, "composition" should be replaced with "preparation".

Appropriate correction of both the above is required.

***Claim Rejections - 35 U.S.C. § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
9. Claim 3 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claim is considered vague, indefinite, and/or confusing, because it is apparently contradictory. That is, when read in light of the specification, independent claim 1 (upon which claim 3 depends) apparently **requires** the presence of **at least some** "inert drying gas"—namely, "nitrogen, helium, argon or a mixture of the cited gases" as set forth in the last full sentence on page 1 of the specification (as noted in paragraph 17. of the 5/5/04 action). **However**, claim 3, as now amended, **requires**

“drying in **pure** superheated water vapour” (emphasis added), thereby **excluding** the use of “nitrogen, helium, argon or a mixture of the cited gases” as the “inert drying gas” of claim 1. **Evidently**, based upon the remarks accompanying applicant’s amendment (p. 8, next to last paragraph), and re-review of the application as a whole, applicant intends to include “pure superheated water vapour” as an inventive “inert drying gas”. While it is **agreed** that the specification may be considered to provide basis for this non-conventional definition of inert drying gas (i.e., as including “pure superheated water vapour”, whereas an “inert gas” is typically considered to be a member of the noble gases (see enclosed Wikipedia definition)), given applicant’s working examples, it is respectfully submitted that the specification does not currently **clearly** define applicant’s “inert drying gas” as including same, **especially** in light of the first two sentences of paragraph [0008]. One means of overcoming this rejection would be to insert “also” after “water vapour can” at line 1 on page 2 of the specification. Appropriate correction is required.

10. Claim 8 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Said claim is considered vague, indefinite, and/or confusing, because it is apparently redundant. That is, independent claim 5 (upon which claim 8 depends), **as now amended**, apparently already requires that “the composition [(actually, ‘preparation’) of claim 5] be atomized and brought into contact with a hot gas stream of the inert drying gas” (i.e., as explicitly recited in claim 8). One means of overcoming this rejection would be to cancel claim 8. Appropriate correction is required.

***Claim Rejections - 35 U.S.C. §§ 102 & 103***

&

***Response to Arguments***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 1, 2, 10 and 11 are rejected under 35 U.S.C. § 102(b) as being anticipated by Abraham et al. (WO 01/25416). With respect to claims 1 and 2, this rejection is **substantially similar to** that set forth in the 5/5/04 action, paragraph 14. Again, Abraham et al. teach methods of preparing anhydrous alkali metal sulfides by spray drying (see Abraham et al. abstract). In every embodiment (example) disclosed by Abraham et al., anhydrous sodium sulfide is produced by spray drying an aqueous composition comprising various forms of sodium sulfide (specifically, aqueous compositions of: sodium hydrosulfide; sodium monosulfide; sodium disulfide; and sodium tetrasulfide—i.e., “liquid substance preparation[s]” within the scope of the Markush group of instant claims 1 and 10) using nitrogen gas—as specifically recited in instant claim 11 (i.e., the Abraham et al. “first inert gas stream” (see p. 8, lines 11-14)) at substantially atmospheric pressure (i.e., pressure limitations within the scope of

instant claim 2) (see Abraham et al. embodiments, beginning at p. 13, line 5, and ending at p. 15, line 23). It is appreciated that instant claims 1 and 10 require that applicant's "inert drying gas" be "loaded with water vapour". And, as explicitly taught by Abraham et al., the "second inert gas stream"—that which is formed in the chamber of the spray dryer, where, clearly, spray drying occurs—"contains (a) the inert gas of the first inert gas stream, (b) solid particulate anhydrous alkali metal sulfide, and (c) water which is typically in the form of vapor or gas" (see p. 9, lines 24-27 (emphasis added), in concert with sentence bridging pp. 11-12, as well as Abraham et al. Figure 1).

Furthermore, it is appreciated that instant claims 1 and 10 require the presence of "a hot gas stream consisting of inert drying gas loaded with water vapour" (emphasis added), whereas the Abraham et al. "first inert gas stream" does not comprise "water vapour" (see p. 8, lines 11-14), while the Abraham et al. "second inert gas stream contains (a) the inert gas of the first inert gas stream, (b) solid particulate anhydrous alkali metal sulfide, and (c) water which is typically in the form of vapor or gas" (see p. 9, lines 24-27). And, as argued by applicant in the remarks accompanying the amendment, "[t]here is no multiplicity of inert drying gases as is involved with the Abraham process" (see p. 7, second paragraph). However, it is respectfully submitted that ultimately the **only** difference between instant independent claims 1 and 10 (as well as instant claims 2 and 11, respectively dependent thereon) and the Abraham et al. teachings is **semantic**. That is, while "applicants method involves **only one** stream that is the liquid substance preparation which contains the alkali sulfide, either in solution, suspension, dispersion or as a water crystallization melt" (see again remarks

accompanying applicant's amendment at p. 7, second paragraph, emphasis added), **so do the methods of Abraham et al.** In particular, the Abraham et al. "second inert gas stream" is **formed by** the "first inert gas stream" and the "solid particulate anhydrous alkali metal sulfide" (see, for example, Abraham et al. claim 1), **plus** "water which is typically in the form of vapor or gas" (see again p. 9, lines 24-27). So, the Abraham et al. "first inert gas stream" and "second inert gas stream" are not, in fact, **two simultaneously separate and distinct streams** forming a "multiplicity of inert drying gases", as urged by applicant, but rather **one and the same stream**, simply at **different points** in the Abraham et al. process; Abraham et al. Figure 1 is believed to **clearly support** this interpretation, showing that the "first inert gas stream" entering via conduit 41 **becomes** the "second inert gas stream" in chamber 14 (and may continue on to **become** a "third inert gas stream" exiting via conduit 53). **Therefore**, it is respectfully submitted that the Abraham et al. processes comprise—even consist essentially of (noting that the Abraham et al. processes do not appear to require any additional steps that would "materially change the characteristics of applicant's invention"<sup>1</sup>)—"spray drying a liquid substance preparation... [within the scope of instant claims 1 and 10] into a chamber and atomizing said liquid substance preparation in contact with a hot gas stream consisting of inert drying gas loaded with water vapour to dry said... [preparation] and thereby produce anhydrous alkali sulfide", as recited in instant claims 1 and 10, with the Abraham et al. "second inert gas stream"—which, again, "contains the inert gas of the first inert gas stream, (b) solid particulate anhydrous alkali metal

---

<sup>1</sup> (per the discussion of "consisting essentially of" in MPEP § 2111.03)

sulfide, and (c) water which is typically in the form of vapor or gas" (see again p. 9, lines 24-27)—considered to read on applicant's atomized "liquid substance preparation **in contact with** a hot gas stream consisting of inert drying gas loaded with water vapour". **Ultimately**, applicant's process stream, per instant claims 1-2 and 10-11, and that of Abraham et al.—within the spray-drying chamber of each process—contain the **same three** components: 1) inert drying gas; 2) solid particulate anhydrous alkali metal sulfide; and 3) water in vapor or gas form. Thus, applicant's argument that the Abraham et al. teaching of "the need to dehydrate the atomized composition... would not lead a person skilled in the art to add water vapour" (see remarks accompanying applicant's amendment at p. 8, first paragraph) has not been found persuasive, since it is maintained that Abraham et al. in fact **require** the presence of a water vapor/gas-containing process stream within the spray-drying chamber. **Accordingly**, it is respectfully maintained that Abraham et al. anticipate applicant's claims 1 and 2, in that spray drying processes for producing anhydrous sodium sulfide meeting all corresponding claim limitations are **exemplified**; **analogously**, it is respectfully submitted that Abraham et al. anticipate applicant's new claims 10 and 11, in that, again, spray drying processes for producing anhydrous sodium sulfide meeting all corresponding claim limitations are **exemplified**.

14. Claims 4-8 are again rejected under 35 U.S.C. § 103(a) as being unpatentable over Abraham et al. This rejection is **substantially similar to** that set forth in the 5/5/04 action, paragraph 16. Again, Abraham et al. are relied upon as set forth above, anticipating both applicant's independent claim 1 (upon which claims 3 and 4 depend)

and claim 2. With respect to instant claim 4, Abraham et al. cannot be considered to anticipate same, in that processes wherein the inert gas drying stream is recycled are not **exemplified**. However, Abraham et al. do teach that the inert gas stream which remains after removal of the solid particulate anhydrous alkali metal sulfide "may optionally be further processed and recycled" (see p. 10, lines 1-3, 20-23). Specifically, "the water vapor... may be removed by known means of dehydration" and the resultant "inert gas stream may then be recycled..." (see p. 10, lines 23-27; see also p. 12, lines 17-20). Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to have utilized gas recycling within the Abraham et al. processes, because, as just discussed, gas recycling is clearly within the broad disclosure of Abraham et al., **and** because the efficiency benefits of recycling any chemical processing stream, whenever possible, are considered to have been well known in the art. "A reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments. *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989)" (see MPEP § 2123). With respect to applicant's independent claim 5 and claim 6, it is noted that these claims are the same as instant claims 1 and 2 **except that a specific** "water vapor load" is required. Thus, Abraham et al. only fail to anticipate instant claims 5 and 6, in that the **amount** of water vapor in each exemplary "second inert gas stream" is not disclosed (see again Abraham et al. embodiments, beginning at p. 13, line 5, and ending at p. 15, line 23). However, it would have been obvious to one of ordinary skill in the art, at the time the invention was

made, to have determined optimal amounts of water vapor within the Abraham et al. "second inert gas stream[s]", because, again, Abraham et al. clearly teach that water vapor is present in these inert gas streams, **and**, absent contrary evidence (noting the discussion of applicant's comparative data in paragraph 17. below), optimization of any result-effective variable taught therein is considered to have been within the level of ordinary skill (see p. 12, last paragraph, wherein Abraham et al. state that "operation of a spray dryer as represented in Figure 1 can be optimized by controlling or selecting the rates, temperatures and compositions... of the feed streams going into the spray dryer"). See MPEP § 2144.05, II and III. With respect to instant claim 7, if the various exemplary aqueous sodium sulfide compositions of the Abraham et al. embodiments do not inherently meet the instantly recited formula requirements, then such formulae are at least generally disclosed by Abraham et al. (see p. 1, lines 16-24, and paragraph bridging pp. 7-8), thereby having rendered their use within the Abraham et al. spray drying processes *prima facie* obvious.

***Allowable Subject Matter***

15. Claim 3 would be considered allowable over the prior art of record ***if rewritten to overcome the rejection under 35 U.S.C. § 112, second paragraph, set forth in paragraph 9. above (as well as the objection set forth in paragraph 7.a. above) and to include all limitations of the base claim and any intervening claims.***

16. The following is a statement of reasons for the indication of allowable subject matter: Abraham et al., considered to be the closest prior art of record, fail to teach or to have suggested processes for producing anhydrous alkali sulfide, comprising spray

drying a liquid substance preparation selected from the group consisting of an alkali sulfide solution, alkali sulfide suspension, alkali sulfide dispersion and alkali sulfide water of crystallisation melt, into a chamber and atomizing said liquid substance preparation in contact with a hot gas stream consisting of inert drying gas loaded with water vapour to dry said composition and thereby produce anhydrous alkali sulfide, **such processes further comprising recycling exhaust gas without introduction of additional inert gas and drying in pure superheated water vapour.**

That is, Abraham et al. fail to teach or to have suggested the use of **pure** superheated water vapour as the drying gas—**without** any of the **requisite** inert gases taught by Abraham et al. (i.e., the “nitrogen, helium, argon and mixtures thereof” disclosed at p. 4, lines 26-28, of Abraham et al.). **Furthermore**, the remaining prior art of record fails to teach or to have suggested the desirability of such a modification of the Abraham et al. processes, providing no motivation to have omitted a **required** component—whether recycled or not—of the Abraham et al. drying gas.

#### **Comparative Data**

17. The comparative data presented in applicant’s specification have again been carefully reviewed, especially in light of the corresponding remarks accompanying applicant’s amendment (p. 8, next to last paragraph). However, it is respectfully maintained that these data cannot be considered sufficient to overcome the *prima facie* case of obviousness set forth above, in that they do not appear to be within the scope of the instant claims; “objective evidence of nonobviousness must be commensurate in scope with the claims which the evidence is offered to support” (see MPEP §

716.02(d)). Specifically, the “Examples” of Table 1 (see p. 7 of the instant specification) use **only** “Water vapour” as the “Drying gas” (see especially p. 7, lines 10-11), whereas none of those claims subject to the 35 U.S.C. § 103 rejection set forth above—namely, instant claims 4-8—are so limited; that is, claims 4-8 encompasses processes wherein the “inert drying gas” may also be “nitrogen, helium, argon or a mixture of the cited gases” (see last full sentence on p. 1 of the instant specification)). Furthermore, in Table 1, it is still not understood how the “Residual moisture” values for applicant’s “Water vapour” examples are significantly different from the “Residual moisture” values for the “Comparative tests”. It is respectfully noted that “evidence relied upon should establish ‘that the differences in results are in fact unexpected and unobvious and of both statistical and practical significance’” (see MPEP § 716.02(b)).

### ***Conclusion***

18. Applicant’s amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR § 1.136(a).

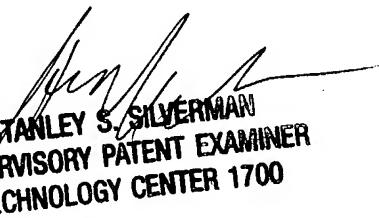
19. **A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR § 1.136(a) will be**

**calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.**

20. Any inquiry concerning this communication or any earlier communications from the examiner should be directed to Ardit E. Hertzog at telephone number is (571) 272-1347. The examiner can normally be reached on Monday through Friday (from about 8:00 a.m. - 4:00 p.m.).

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman, can be reached on (571) 272-1358. The fax phone number for the organization where this application is assigned is 703-872-9306.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. For any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
STANLEY S. SILVERMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 1700

  
A.E.H.

November 1, 2004